



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of )

FRIEDRICH et al. )

Serial No. 09/235,242 )

Filed: January 22, 1999 )

For: PREPARATION OF  $\beta$ -ALKOXYNITRILES )

Art Unit: 1613

Examiner: L. Stockton

APR 19 2000

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Honorable Commissioner of  
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Sir:

REQUEST FOR RECONSIDERATION

In response to the final office action of February 16, 2000, applicants respectfully request the examiner reconsider the rejected claims based on the following arguments in the above-identified application.

Claims 2-6, all of the claims in this application have been rejected under 35 USC 103(a) as being unpatentable (obvious) over Green in view of Sullivan and O'Lenick (abbreviated reference names adopted from prior amendment). These references fail to support a *prima facie* case of obviousness as explained below.

The instant claims recite a two-step process for the synthesis of  $\alpha$ -alkoxyamines from  $\alpha$ ,  $\beta$ -unsaturated nitriles. In the first step, an alcohol (or polyol) reacts with the unsaturated nitrile to form an alkoxynitrile. The second step is hydrogenation of the nitrile to the corresponding amine.

The crux of the inventive contribution to the art is the use of a recited class of diazabicycloalkenes as the required basic catalyst for the first (addition) step. The use of the recited catalysts makes it unnecessary to remove or neutralize the basic catalyst before carrying out the second (hydrogenation) step in the presence of any hydrogenation catalyst.

Elimination of the need to remove or neutralize the basic addition catalyst, which was customary and necessary in prior art processes, has obvious economic advantages on an industrial scale and constitutes an important and unobvious improvement over the prior state of the art. The advantage of applicants' process is explicitly included in the claim recitation, both as specifying non-removal of catalyst and as carrying out the hydrogenation in the presence of the catalyst.

Green teaches a reaction that corresponds in part to the first step of the here claimed two-step process, i.e., the addition of alcohols (or amines) to an activated olefin broadly, e.g., acrylonitrile. The reaction is disclosed as being catalyzed by diazabicycloalkenes within the class recited in the instant claims. However, Green does not disclose any subsequent reaction of the alkoxynitrile product. Green also discloses that the diazabicycloalkenes can catalyse the reverse reaction to yield the original alcohol and unsaturated nitrile (column 4, lines 12-16, and Example 14), a factor which would suggest that the catalyst should be removed prior to any subsequent reaction, particularly at elevated temperatures. In fact, Green teaches that it is necessary to remove addition product from the reaction mixture as it is formed: column 4, lines 25-32. Applicants' claims can not rationally be read to include Green's process of product removal because of the two explicit limitations discussed above.

O'Lenick discloses the addition of alcohols to acrylonitrile followed by hydrogenation of the resulting alkoxynitrile. It cannot be ascertained with certainty whether or not O'Lenick separates the alkoxynitrile from the reaction mixture prior to the

hydrogenation reaction. See the disclosure at column 4, lines 48 -53, which states that "β-alkoxypropionitrile," not the reaction mixture, is then hydrogenated. That disclosure is ambiguous at best.

It is to be noted that alkaline catalysts, and not the cyclic amines of the present claims and Green are used in the addition step of O'Lenick. It is also to be noted and emphasized that applicants' process gave yields of 88%, 99,5% and 96% in the three working examples. O'Lenick, on the other hand, yields of only 58.2% and 68.2%, except where free radical inhibitors were used. Such inhibitors cannot be read into applicants' claims because of the recitation "consisting essentially of." The disclosure of the O'Lenick reference itself establishes that free radical polymerization inhibitors "materially affect" the inventive process.

To whatever extent O'Lenick may be considered to disclose hydrogenation without prior isolation of the first step product, the unobvious improvement in yields flowing from the use of the recited catalysts in place of the strong bases would serve as sufficient evidence to overcome any *prima facie* case of obviousness which might arise.

The record is also replete with extrinsic evidence, in the form of publications, which illustrate that one of ordinary skill would not have been led to carry out the hydrogenation step as recited in the instant claims, without the removal or neutralization of the basic catalyst. That evidence has been discussed at length in previous responses to examiner's actions, and the point will not be belabored here. It should be noted however that the evidence in question makes one of ordinary skill less likely to interpret the ambiguous disclosure of O'Lenick referred to above as relating to hydrogenation of the unrectified first stage reaction mixture, especially since O'Lenick is using stronger bases than Green or applicants.

FRIEDRICH et al. Serial No. 09/235,242

Sullivan adds nothing of particular relevance to the first two references discussed because it relates to thio analogs and is thus less closely related to the present claims than is Green.

One feature of the Sullivan disclosure is significant, however, despite the foregoing comments. Sullivan teaches immediate removal of the amine catalyst, and thus further teaches away from applicants' process. In re Baird, 16 F.3d 380, 29 USPQ2d 1550 (Fed. Cir. 1994).

In view of the teaching away found in two of the three references relied on by the examiner, as well as the references brought forth by applicants, the instant claims cannot be considered to be unpatentable over this entire record.

The examiner is respectfully to reconsider the rejection of the instant claims in view of the arguments of record as emphasized and supplemented by those herein.

Respectfully submitted,

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